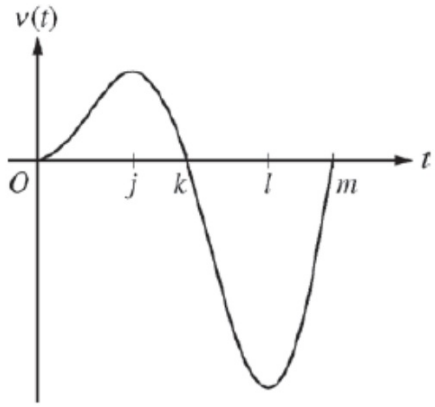
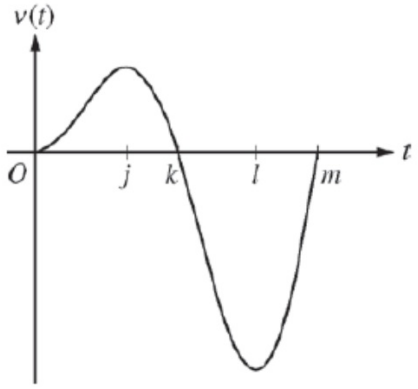
Motion on a line (Interpreting f'(velocity) graphs)

[0, m]



1) State the value(s) of t where the particle is at rest.

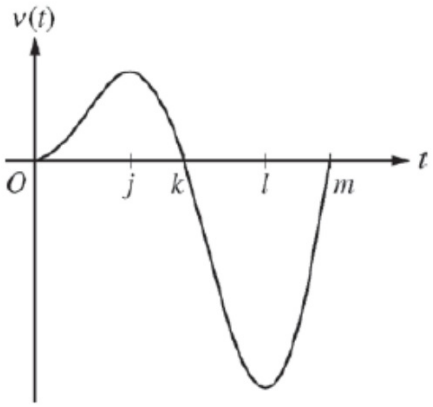
$t = 0, k, m$ $\quad v(t) = 0$



2) State the value(s) of t where the particle is changing direction.

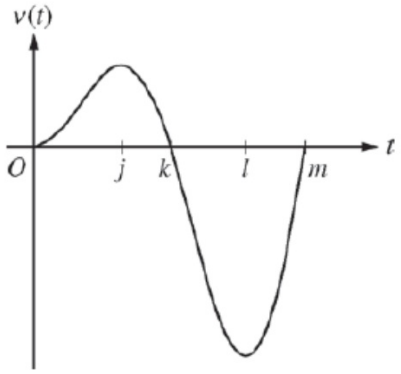
$t = k$

$V(t)$ is changing signs



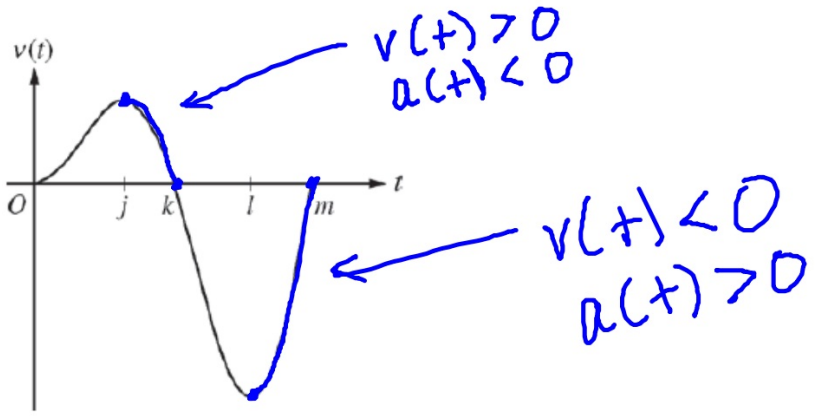
3) State the interval(s) where the particle is moving to the right.

(0, k) because v(t) > 0



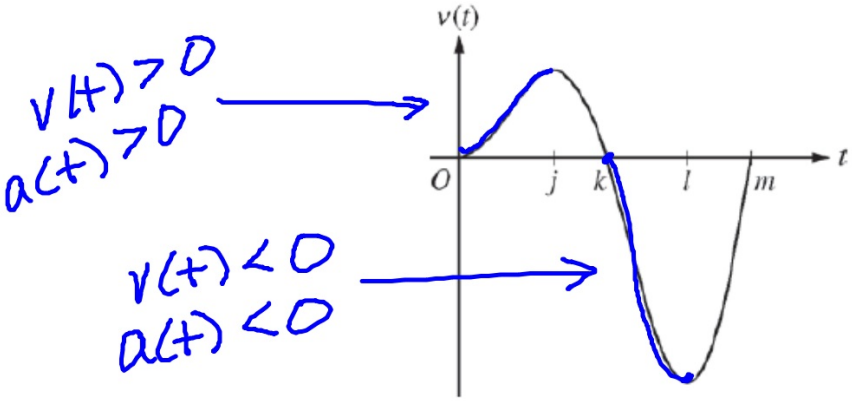
4) State the interval(s) where the particle is moving to the left.

(k, m) because $v(t) < 0$



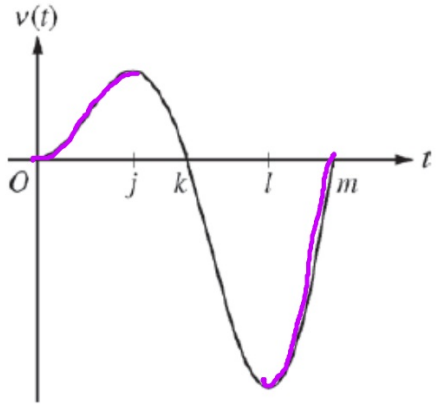
5) State the interval(s) where the particle is slowing down.

(j, k) U (l, m) because v(t) and a(t) have opposite signs



6) State the interval(s) where the particle is speeding up.

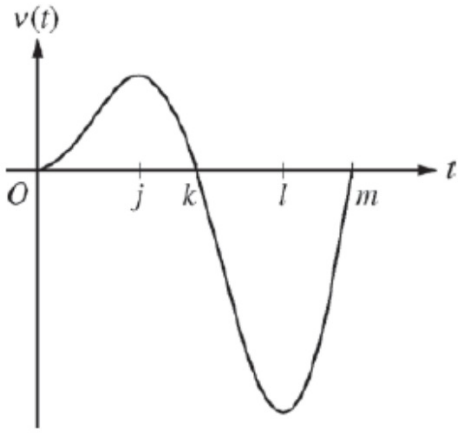
(0, j) U (k,l) because v(t) and a(t) have same signs on these intervals



7) State the interval(s) where the velocity is increasing.

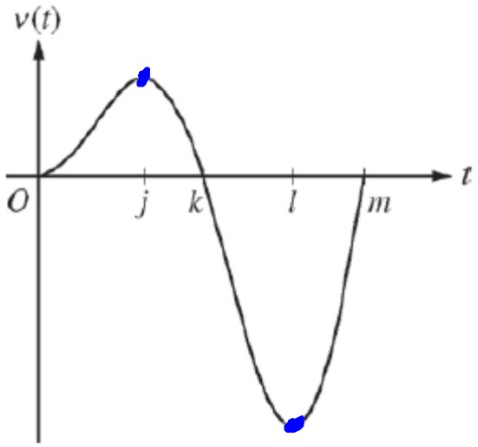
(0, j) U (l,m) because slope of v(t) > 0 on these intervals

because a(t) > 0 on these intervals



8) State the interval(s) where the velocity is decreasing.

(j,l) because slope of v(t) < 0



9) At what time(s) is the acceleration zero?

$v'(t) = 0$

t = j, l because v'(t) = 0 at these times
because the slope of velocity is zero